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AMERICAN DYESTUFF REPORTER

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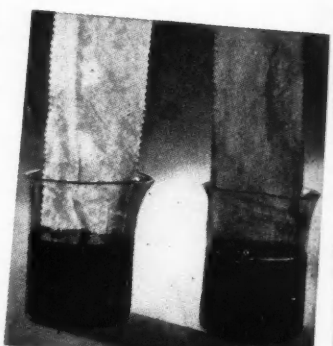

DECERESOL OT has excellent dye levelling properties. "Grey" cotton fabric (left) dyes unevenly. A dye solution containing 0.05% DECERESOL OT 100% (right) produces uniform, level dyeing.

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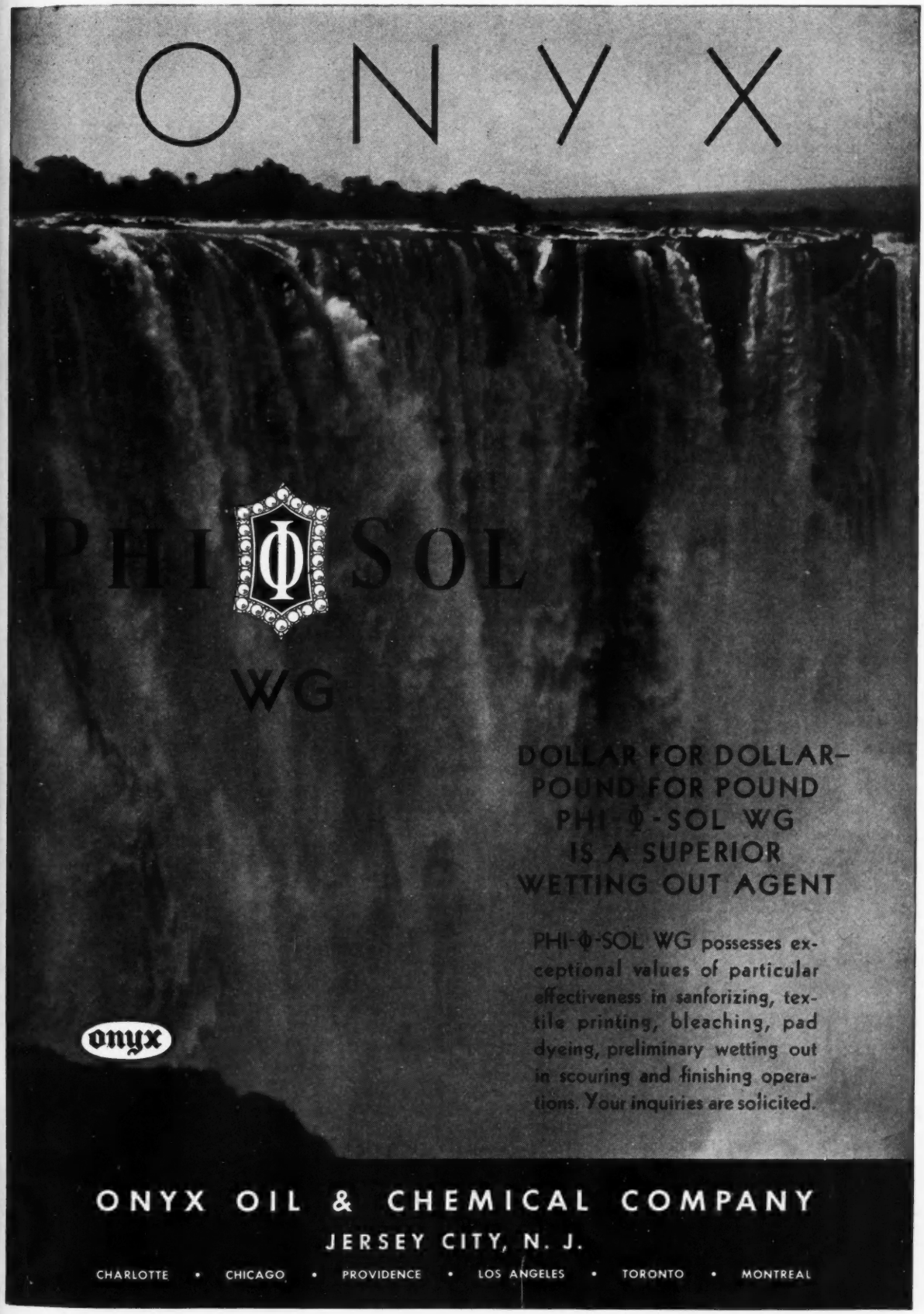
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One of the subjects to which we devoted a great deal of study was the development of a much better *plasticizer for starch* wherever it is used in the textile industry. One of the most important applications is in the size for cotton warps where tallow — or proprietary size compounds containing mineral substitutes—are commonly employed.

As is generally known, when tallow is used in the proportion of 1 part to 10 parts of starch, without a plasticizer, the warp is too brittle and chafing occurs. But, when the percentage of tallow is increased, the warp becomes too soft and fuzz balls form on the loom, breaking the warp yarn.

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Sizing compounds that are not straight tallow usually contain mineral oils, waxes or calcium chloride and depend on these ingredients to compensate for the deficiencies experienced when no real plasticizer is used. However, these substitutes, or adulterants, are sometimes difficult to *desize* properly, often cause discoloration in the warp and prevent a good bleach. In singeing broadcloth, shirtings, white goods and similar materials before desizing, the heat of the singeing machines causes calcium chloride to yellow the goods. This does not bleach out and, therefore, prevents a perfect white.

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Other materials such as various gums, paraffine oils, beeswax, gum tragasol and locust bean gum are used to strengthen the combination of tallow, starch and water. In our research we naturally experimented with these substances. However, we found one difficulty common to them all: they simply lay on the outside of the warp yarn and do not assist the *penetration* of the size into the yarn —which is an essential consideration. The use of gums, it appeared, merely made the size thicker, so that fewer yards could be sized with the same quantity... and accordingly increased the cost of the size.

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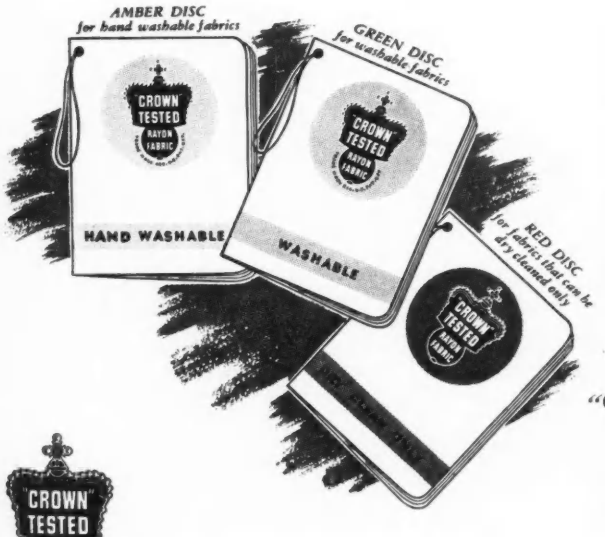

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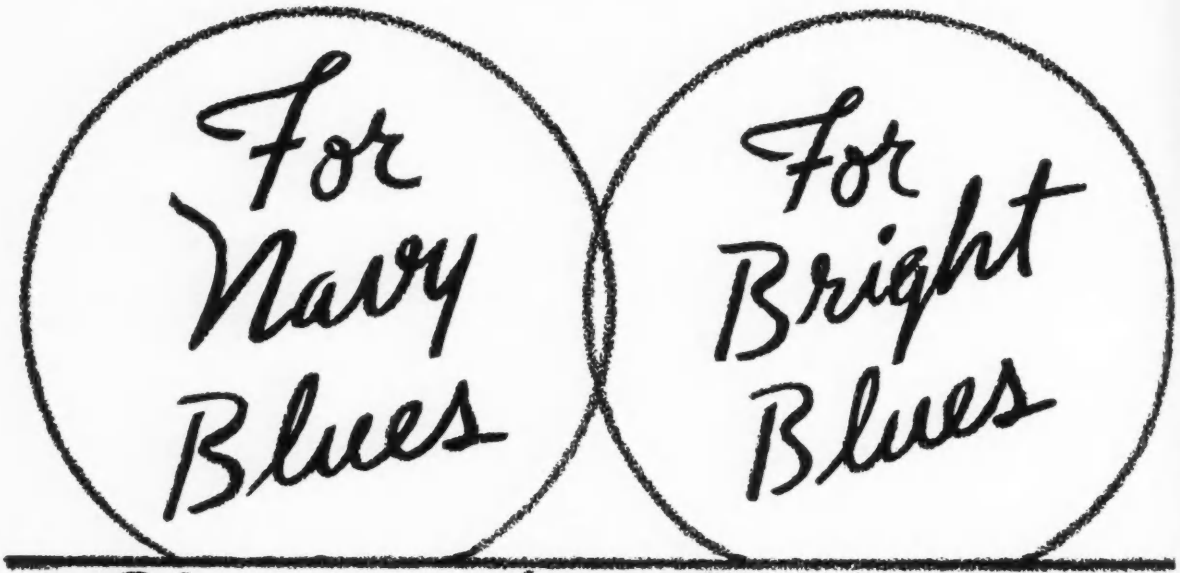

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JULY 31, 1944

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AMERICAN
DYESTUFF REPORTER
VOLUME 33 JULY 31, 1944 NUMBER 16

FAULTS IN WOOL DYEING

*Their Avoidance and Correction**

F. TOWNEND

A COMPREHENSIVE survey of the variety of troubles which beset the wool dyer would occupy several large volumes; accordingly, aspects have been selected which appear to be of particular interest, viz. dyeing faults which are caused by alteration in the structure of the wool fiber itself. Metal stains, oil spots and other troubles of a similar nature due to contamination of the wool fiber with extraneous substances are not considered in the present paper. Further, attention has been confined to the primary effects of the various processes on the affinity of wool for dyes, although at some points the way in which these effects may be complicated by secondary causes are considered.

Experience of service enquiries dealing with dyeing faults indicates that troubles occur all too frequently and often very mysteriously. It is very unfortunate that faulty material is not usually detected until it has been dyed. Because of this the dyer frequently receives the blame for faults which he has not caused, but merely exposed, which he cannot guard against unless forewarned, and which he often has considerable difficulty in correcting. Immediately the wool fiber starts to grow it is subjected to influences which effect its dyeing properties. While still on the sheep it is exposed to the detrimental action of sun and weather. After shearing, wool is put through a succession of processes, viz. scouring, setting, bleaching, milling, carbonizing, and possibly anti-shrinking, all of which have a potential effect on its dyeing properties. Further, dyeing properties of wool are, in many cases, much more sensitive to such treatments than are other properties of the fabric, and the changes are often cumulative. For this reason the causes of dyeing defects are often very difficult to determine. Nevertheless, when it is remembered that the material in a worsted piece has passed through three scouring processes and one or more setting processes, it is surely a great tribute to the excellence of these processes that more trouble is not encountered in dyeing.

There are obviously three types of fault which may appear to the eye when inspecting dyed materials. The faulty places may be lighter, darker, or different in shade from the rest of the goods. Actually, the last type, since this discussion is restricted to the consideration of faults caused by chemical changes in the wool, is a special example of one of the other two. It will usually be caused by a difference in behavior of the constituents of the dyeing recipe. Only increases or decreases in affinity, therefore, will be considered, and it is convenient to refer to the various types of damage causing these changes as heavy-dyeing or light-dyeing damage, respectively.

The object of this paper is to show that, where either of these changes in affinity occurs, our present knowledge of wool fiber chemistry can furnish a reasonably satisfactory explanation of the reasons for the change in affinity.

CARBONIZING

As Speakman has shown, there is in the wool fiber a balance between acid and basic groups.[1] When this balance is tilted towards the acid side, the material dyes lighter than normal wool in the same dyebath. Processes which bring about this alteration are carbonizing, peroxide bleaching and sulfur stoving. A similar effect is, of course, obtained when wool is deaminated, but, since this process has already been adequately considered by Speakman[2] in connection with the chemical theory of wool dyeing, it will not be discussed further in this paper.

American workers have shown[3] that the sulfuric acid used in carbonizing may react with basic groups in wool to give substituted sulfamic acids which are very stable. If this reaction does not occur evenly all over the piece, then the well known light streaks show up on dyeing with acid dyes. On the other hand, the same streaks dye more heavily with basic dyes than does the rest of the material. Speaking practically, prevention is the only method of dealing with this trouble. The pieces should be thoroughly washed after scouring, sufficient time allowed for even impregnation with sulfuric acid and the material then efficiently squeezed or hydroextracted. In the case of cloths known to be prone to the form of unevenness, it would seem that improved results could be obtained by squeezing, returning to the acid bath for a further immersion and then squeezing again.

With certain shades, the fault may be covered to a considerable degree by the use of a basic dye of similar shade. Medium reds may be improved by topping with Rhodamine BS from 1 per cent acetic acid baths at 60°C.; Methylene Blue 2BS may be used similarly for blue shades. Obviously, the method is difficult, depending on the amount of difference between the light streaks and the rest of the material. The final shade of the piece will also be darker than the original pattern. Nevertheless, with all its disadvantages, the method represents a useful standby in cases of emergency.

The statement that carbonized wool dyes lighter than normal wool rests very largely on the behavior of dyes of the level dyeing type, these being the ones commonly used in practice on such material. It appeared simpler to carry out tests on other dyes, rather than to refer to the extensive literature, in order to find out whether this also applied to other classes of dyes. Hanks of worsted yarn were therefore put through a carbonizing treatment, washed off and allowed to stand overnight in water containing more than the calculated requirement of ammonia. Uncarbonized hanks were wetted out and allowed to stand overnight in the same liquor. On dyeing with a selection of

* Presented at meeting, West Riding Section, Society of Dyers and Colourists, February 25, 1943. Reprinted from the June, 1944, issue of their Journal.

typical dyes by the chromate method, the carbonized hanks took up more dye than the untreated material. This was in obvious disagreement with theory and, accordingly, a second experiment was carried out, involving carbonized yarn, yarn soaked in sulfuric acid of the strength used in the carbonizing, but not dried, and untreated yarn. The three materials were treated as before, but, after the first standing overnight, they were put into a fresh warm ammonia bath and allowed to remain in the cooling liquor for another day. On dyeing these three materials together in one chromate dyebath, the two uncarbonized hanks both took up the same amount of dye, whilst the carbonized yarn was dyed lighter in shade. It was apparent that the first result had been produced because of residual acid remaining in the carbonized wool. Apart from its confirmation of the general lighter-dyeing properties of carbonized material, the experiment is interesting as an illustration of the difficulties attendant on the apparently simple instruction frequently given to wool processors, viz. "the wool should be neutralized before dyeing." It is of further interest as illustrating the complexity of the possible causes of a given uneven dyeing.

A recent very thorough article by Peel[4] mentioned another example of the complex effects which may contribute to unevenness in a dyed piece, viz. darker marks due to undercarbonizing.

PEROXIDE BLEACHING

In peroxide bleaching, sulfur groups are oxidized in a progressive manner, giving ultimately sulfonic acids.[5] The affinity for dyes is consequently reduced. Relatively little wool is bleached for dyeing, the wide range of dyes available being usually sufficient to obtain the desired shade without recourse to bleaching. In order to obtain the required brightness of shade, a choice has to be made between (1) improving the color of the wool and then dyeing with a fast-to-light dye, and (2) dyeing the unbleached wool with a brighter dye, usually of lower fastness to light. The difference in the fastness to light of a given shade produced by these two methods will be less than that indicated by pattern card figures. This is due to the bleached wool being readily yellowed by exposure to light, and pale shades, even of fast-to-light dyes, have decreased fastness to light on bleached material; in addition, much of the value of the peroxide bleach is lost in boiling acid dyebaths.

Little trouble appears to be encountered with the small amount of wool which is bleached prior to dyeing. This is probably due to the nature of the bleaching process adopted, the usual overnight treatment being slow and therefore, conducive to even results. Uneven dyeings have rarely been encountered where the trouble could be traced to uneven bleaching. On the other hand, wool bleached with the object of producing a really good white, with no intention of subsequent dyeing, will be frequently found to cause trouble if it should be dyed.

SULFUR STOVING

Finally, sulfur stoving might be expected, from work carried out by the Wool Industries Research Association,[6] to give material of reduced affinity for dyes. This is, in fact, the case. To an even greater degree than with peroxide bleaching, sulfur-stoved wool loses its whiteness when exposed to light or when treated in acid dye liquors. Sulfur-stoved material, therefore, is very rarely dyed, and this is fortunate, since another source of worry for the dyer is thereby obviated. Because it is well-known that sulfur-stoved material is frequently very uneven in dyeing properties, it is customary to dye rejected batches of such material, e.g. yarn, to black shades.

The effect of sulfur stoving on dyeing properties is merely mentioned to complete the picture of treatments of wool which decrease the affinity for dyes by increasing the number of acid groups in the wool.

INCREASED AFFINITY FOR DYES

On the other side of the picture, there are treatments or processes which increase the affinity of wool for dyes. Greater affinity is not, however, due to increase in the number of available basic groups, but is simply caused by the fiber becoming more accessible to dyes. The most commonly encountered example of increased affinity is due to alkali damage, which may result through scouring at too high an alkalinity, or at too high a temperature. Damage may also occur when material has not been thoroughly washed off after scouring and has been allowed to dry out in an alkaline state. Here again prevention is better than cure, and avoidance of excessive alkalinity or too high a temperature, together with thorough washing off, are the points to be watched. In addition, attention should be paid to co-ordination of scouring and dyeing, so as to avoid scoured material being left lying about.

Setting processes, e.g. crabbing and blowing, or potting, also impart to wool an increased affinity for dyes. In such cases the fault usually appears in the form of ending or listing, but occasionally as longitudinal marks in the pieces. When such troubles are encountered in practice it is necessary to treat each case on its own merits, and no general directions can be given for tackling such problems, as far as prevention is concerned.

Anti-shrink processes, which are attracting increasing attention throughout the wool trade, give materials showing a varied change in affinity for dyes. This is true of the older chlorination processes and of the new solvent processes, e.g. the sulfuryl chloride and the T.B.L. alkali process. Whilst the change in affinity is usually an increase, to a degree depending on the dyes and dyeing method used, decreases in affinity are occasionally obtained with certain dyes. This is particularly true of wet chlorination processes carried out in the presence of organic acids. Wet chlorination processes, in general, are particularly liable to give rise to uneven-dyeing material, because the action between the chlorine or hypochlorous acid and the wool occurs very rapidly. It is not meant to imply that the anti-shrink properties are necessarily uneven, but the dyeing properties are much more sensitive to small differences in degree of chlorination than are the anti-shrink properties. Thus, whilst the milling properties of a certain fiber may be adequately removed by reaction with 1-1.5 per cent of chlorine, the affinity for dyes will go on increasing with greater amounts of chlorine. Since it is usually necessary to employ between 2 per cent and 3 per cent chlorine to ensure satisfactory anti-shrink properties in bulk, it is evident that parts of the material will dye differently from other parts, whilst the anti-shrink effect will be reasonably uniform.

All these cases where increased affinity for dyes has given rise to uneven dyeing material may be treated by a variety of methods, but before discussing them a peculiar intermediate case deserves mention, viz. wool damaged by exposure to light.

LIGHT DAMAGE

Wool which dyes lighter than normal due to peroxide treatment does so, to differing degrees, with all types of acid or chrome dyes. The same is true for the various treatments which produce increased affinity for dyes. On the other hand, "tippy" wool occupies an intermediate position, in that the tips dye more heavily with fast acid and chrome dyes, but less heavily with many level dyeing acid dyes. In the case of the latter, the tips are initially dyed more heavily, but at b.p. the dye migrates to the roots, frequently giving lighter-dyed tips than roots. This has not been found to occur with alkali damaged, set or chlorinated wools.

PRODUCING SATISFACTORY DYEINGS

As regards the question of producing satisfactory dyeings on faulty material showing heavy streaks, the fault may be corrected by re-dyeing with selected dyes, or by re-dyeing in presence of certain auxiliary products, or by certain treatments of the material before re-dyeing. Whilst it would at first sight appear that additions to the dyebath would be more economical than a separate treatment, closer consideration shows that this is not necessarily true. Normally, evidence that material is faulty in dyeing properties is obtained only after the material has been dyed. It then becomes necessary to consider what line of action to take. Obviously, if a strong suspicion existed prior to dyeing that the material was faulty, it would be worth while doing something before the fact was proved. Having produced a faulty batch, however, a decision must then be made as to whether it is possible to dispose of the goods without attempting to eradicate the fault, or whether to cover the fault by dyeing to a heavier shade, or whether to attempt to strip the material and re-dye satisfactorily to the original shade. Probably the second of these procedures is normally the best, but the incidence of rationing has made it necessary to consider the third much more frequently than hitherto. In many cases simple boiling of the goods in a blank dyebath, or a Glauber's salt strip, followed by re-dyeing, will correct the faulty material. If the goods have been dyed with level dyeing acid dyes, one or other of these methods should be tried. The second method is considered to be preferable, and trying it on a portion of the material showing the faults is recommended. Failing other apparatus, a 2-gal. bucket may be used for about 12-oz. of material. If the fault disappears, it is probably not due to permanent damage to the wool, but either to uneven distribution of alkali or acid in the goods originally, or to insufficient boiling following too rapid dyeing, or to foreign bodies on the wool. It should then be possible to apply the treatment to the whole of the goods and obtain satisfactory results.

If the fault does not disappear, then more drastic measures will be required, involving in the first case thorough stripping of the material. Where chrome or fast acid dyes were used in the original dyeing it will be useless to attempt to cure the fault by "cobbling," and stripping should be resorted to immediately. Here again, stripping methods must depend on the dyes used. In general, a reducing strip will remove most azo dyes, but not anthraquinonoid or triphenylmethane dyes. Certain chrome dyes are difficult to reduce, but this is facilitated by pre-boiling the material in citric acid or oxalic acid. After stripping, and particularly before re-dyeing with fast dyes, the goods should be thoroughly neutralized in a hot ammonia bath.

Having obtained a satisfactory strip by a selection from the above processes, three methods of attack or available. Firstly, the goods may be re-dyed with specially selected dyes which are not so susceptible to differences in the material as the dyes originally used. Alternatively, the same dyes may be used, but a different method of application adopted. In the case of chrome dyes, for instance, the chromate method frequently gives more uneven shades on damaged wool than are obtained with the same dyes dyed afterchrome. The chrome mordant process will usually give even better results. It is wise, therefore, to avoid the use of the chromate method in re-dyeing and to adopt either the chrome mordant or the afterchrome process. Most fast acid dyes are fundamentally incapable of dyeing damaged wool evenly and should be avoided wherever possible. Certain exceptions to this general rule exist; Disulphine Blue AS and products of the Wool Fast Blue BL type may be used with every confidence.

Most level dyeing acid dyes give relatively even results on mixtures of normal and damaged wool. If, when using level dyeing acid dyes, unevenness is still apparent after prolonged boiling, this is evidence of very considerable damage, and selection of alternative dyes is unlikely to be of assistance. It may be possible to obtain satisfactory results by the expedient frequently adopted in garment dyeing, viz. increasing the quantity of sulfuric acid.

Selection of dyes or dyeing method on the lines indicated may be expected to give improvements, but is by no means certain to give perfect results. The second line of action, viz. addition of auxiliary products to the dyebath, is next considered.

USE OF AUXILIARY PRODUCTS

Circumstances make it impossible to treat this topic with all the detail which is desirable. There are many patents concerning the use of cation-active substances as additions to acid dyebaths, with or without anion-active substances or dispersing agents of the polyethenoxy-type. Many dyers have tested the claims made for these substances with most conflicting results, and the present author has had similar experiences.

The following quotations from a relevant patent seem to sum up the position very well—

"The dyeing is improved, the tints obtained being, *quite surprisingly*, more vivid and fuller than those without the assistant." And later, "The invention is particularly applicable in dyeing wool or silk, and valuable, *even surprising*, effects may be obtained with very different dyestuffs." (N.B. Author's italics.)

PRETREATMENTS

Passing to the third method, viz. treatment of the stripped goods prior to re-dyeing, mention must be made of the work carried out at Leeds University by Race, Rowe and Speakman.[7] This work established the chromium acetate pretreatment, which was, and is, of particular benefit in preventing the lighter-dyeing proclivities of wool damaged by exposure to sunlight.

A complementary treatment was discovered in the Blackley Laboratories about a year ago and appears to be more generally applicable to darker-dyeing damaged wool than any other method yet disclosed. This pretreatment uses hydrogen peroxide under a variety of controlled conditions. It has already been pointed out that damaged wool dyes more heavily than normal wool, due to greater accessibility. Hydrogen peroxide bleaching also reduces the affinity of wool for dyes. Hence, when two samples of wool are treated together, the material which absorbs dye more rapidly also reacts more readily with hydrogen peroxide and, consequently, its affinity is reduced to a greater extent, until the two materials have approximately the same affinity for dyes. The usefulness of this reaction in the treatment of faulty material will be immediately apparent. If the fault is definitely of the second type discussed, viz. due to local increases in affinity for dyes, then treatment of the goods with hydrogen peroxide will tend to even out these differences and enable satisfactory results to be obtained by the dyer. However, it is not suggested that as good a result will be achieved as would have been the case had the fault not developed.

Various conditions of hydrogen peroxide concentration, temperature and time of treatment may be employed, the action being carried out in alkaline solutions at about *p*H 9.5. At 40° C., treatment for 3 hr. in 2 vol. hydrogen peroxide is required, while at 80° C. only 30 min. treatment in 0.25 vol. hydrogen peroxide is necessary. The alkalinity is controlled by adding 3 lb. trisodium phosphate per 100 gal. of liquor. While these conditions of treatment permit some latitude without adverse effects, overtreatment with peroxide further reduces the affinity of all the wool, and at the same time decreases the wet-fastness properties of the dyeings obtained. Hence, reasonable precautions should be taken to ensure that the condi-

tions of treatment are adhered to fairly closely.

The treatment with 2 vol. peroxide at 40° C. is the most suitable where the amount of material to be handled is considerable and can be conveniently divided into small lots. A standing bath may then be used, replenishing with the necessary hydrogen peroxide for the second and subsequent batches. The required addition of peroxide is readily determined by a simple permanganate titration, but is usually equal to about one-third of the original quantity. These conditions of treatment should also be employed when pale shades are to be dyed, since treatment at higher temperatures causes appreciable yellowing of the ground. Where only single lots require treatment, it is probable that 0.25 vol. peroxide at 80° C. will be found more economical.

It should be observed that the conditions of treatment at 40° C. are very similar to those employed in the normal peroxide bleaching of wool, where the action is started at about 50° C. and allowed to continue in a cooling bath overnight. Similar results with regard to improvement of dyeing properties are obtained under these conditions when a 2 vol. peroxide bath is used. In fact, these conditions were the first to be tried out in the experimental work at Blackley, but obviously the action is to some extent out of control, the rate of fall in temperature depending on bulk of liquor, air temperature, etc. Using this method, therefore, there is some danger of over-bleaching.

These treatments are effective in reducing uneven dyeing properties due to alkali damage or setting treatments. They are also effective on material anti-shrunk by hypochlorite in presence of hydrochloric acid, gaseous chlorination, or the new solvent processes, e.g. the T.B.L. alkali process or the sulfuryl chloride process. Improved results are also obtained with tippy wool or faded garments. It was this latter effect only which was noticed by Bedu in 1938.[8]

The process is not merely applicable to differently damaged samples of the same wool, but can also be used to treat wools of different origins and dyeing properties, e.g. Cape and Australian Merinos.

It appears to be agreed that the varying dyeing properties of wools from different sources are essentially due to differences in physical structure giving rise to unequal accessibility, or unequal rates of dyeing. Since the degree of action of hydrogen peroxide appears to depend on this same accessibility, it will be apparent that the dyeing properties of blended wools will be evened out by the treatment.

Various questions arise with regard to this process. Firstly, is the hydrogen peroxide an essential part of the treatment, or would the same results be obtainable on uneven-dyeing wool materials by the simple action of buffer solution at *p*H 9.5? Actually, from the way the general subject of changes in affinity for dyes has been developed, this question is perhaps superfluous. In fact, the answer is in the negative and the various differences in dyeing properties which have been discussed are not removed by simply equalizing the *p*H values of the materials.

Secondly, is the alkaline *p*H necessary to give the desirable reaction conditions? In this case the answer is in the affirmative, and any drop in the *p*H below 9 requires disproportionate increases in concentration of hydrogen peroxide and time or temperature of treatment.

Thirdly, the possibility of carrying out the treatment under dyebath conditions is one which has always been kept in mind. Unfortunately, wool dyebaths are usually acid in reaction and under such *p*H conditions wool does not appear to be readily oxidized by peroxide; consequently, the benefits described cannot be obtained by simply adding hydrogen peroxide to the dye liquor. Other oxidizing agents may, of course, be found to do this, but attempts to activate or catalyze the oxidative decomposition of peroxide in acid solutions with polyvalent metals have failed. It is possible, however, to carry out a considerable degree of stripping while treating with peroxide, particularly if chrome dyes have not been used. If the uneven-dyed material is treated directly with alkaline hydrogen peroxide, the difference in depth of shade will be corrected to a considerable extent and the remaining slight unevenness will disappear on subsequent re-dyeing.

Unlike the chromium acetate treatment, the hydrogen peroxide process cannot claim to restore the damaged wool to a physical condition nearer to normal. Quite the opposite effect probably occurs, further sulfur linkages being broken and oxidized, in addition to oxidation of already broken links. From the point of view of a dye molecule, the ease of ingress to the fiber increases only slightly, but the attraction of the interior is considerably reduced.

The variety of circumstantial evidence which has been brought forward throughout the general discussion indicates that this view of the underlying mechanism of the hydrogen peroxide treatment is the true one. It is also supported by comparison of the rates of dyeing of wool before and after treatment with hydrogen peroxide. If a mixture of heavy-dyeing damaged wool and normal material is dyed, the damaged wool absorbs dye relatively quickly, even at low temperatures, and to a degree depending on the severity of the damage and on the dye used. It is this property which is used in the various staining tests with Naphthalene Scarlet 4RS or Azo Geranine 2GS (Kiton Red G) (*Colour Index*, No. 31) for detecting damaged wool. As the temperature is raised, dye begins to be taken up by the undamaged material, and at b.p. migration of dye from the damaged wool brings the two patterns nearer in shade. With most acid milling dyes, even after boiling for 4 hr., reasonable equality of shade is not obtained.

With peroxide-treated patterns, however, there is a very different state of affairs. The difference in dye absorption at low temperatures is much less marked, and is only very slight by the time the dyebath reaches b.p. After about 30 min. at b.p. this slight unevenness disappears, and a stationary condition is reached and maintained for about 1 hr. while the dye is, as it were, settling down within the materials. After this period, which allows adequate time for a normal large-scale dyeing to be completed, including topping, the damaged material starts to lose dye to the undamaged material and becomes gradually weaker in shade. It is thus evident that the damaged wool has not been repaired in the proper sense of the term, but has merely been patched up, so as to permit the production of an acceptable commercial article. It does this both by equalizing the absorption of dye and by increasing the subsequent levelling or boiling off. With this increased levelling property is associated a reduction in fastness to wet treatments.

This reduction is roughly in inverse proportion to the normal fastness of the dye to wet treatments. Chrome dyes show very little loss in fastness and Carbolan and other faster acid milling dyes also show a fastness to wet treatments which is almost equal to that of their dyeings on normal wool. It is when products intermediate in properties between level dyeing acid dyes and chrome dyes are reached that the effect becomes noticeable, and a dye with an average grading for wet treatments of 3-4 might become anything between 2-3 or over, depending on its individual peculiarities. Level dyeing acid dyes suffer an even greater diminution.

Despite these drawbacks, here is a method, involving no unusual chemicals, whereby the appearance of faulty material can be greatly improved and, under the best conditions, appear as if the damage had not occurred. The effect on the general physical properties of the fabric or yarn is known from the wide technical experience of peroxide bleaching. The peroxide treatment for covering damage approximates to the conditions of a very mild bleaching for white, and imparts only a slightly harsher handle to the wool, with an effect on the breaking strength which is certainly not greater than 5 per

cent both in extension and load.

Fortunately, or otherwise, under present conditions in the dyeing trade many cases where this treatment was applicable have not been encountered. At the present time more trouble seems to be encountered with carbonizing than with any other form of damage. The method has been applied successfully, however, on a number of occasions, of which three examples are given. One of these concerned a tubular-knitted fabric which had been scoured and then left lying about prior to dyeing. It developed brown stains which dyed more heavily than normal with level dyeing acid dyes. This material was treated by the customer himself, on the lines of the simple instructions given earlier, and then gave no trouble on re-dyeing. Another instance concerned material which had been splashed with concentrated hypochlorite, giving a bad brown stain of greatly increased affinity for dyes. Since this material had to be dyed to a pale pink, there were doubts about the shade of the ground itself, quite apart from the question of uneven dyeing. However, the peroxide treatment again proved equal to the occasion and satisfactory results were obtained.

Another very recent example is interesting as it concerns a type of damage which has not yet been discussed. A wool-cotton union hosiery material was required to be dyed to a blue shade by the one-bath method and heavy stains of Chlorazol Sky Blue FFS were obtained on parts of the wool. Microscopic examination revealed that the heavy-dyeing parts had been subjected to attack by mildew. The material dyed evenly after treatment with peroxide.

So far, the discussion has been of remedies for faults which arise accidently and only occasionally, due to uneven alteration in the affinity of wool for dyes during the usual processing. Such alterations are unfortunate and, when they arise in any marked degree, are liable to give rise to considerable trouble.

ALTERING AFFINITY OF WOOL FOR DYES

Apart altogether from these occasional difficulties, it has often been proposed to take advantage of the possibility of altering the affinity of wool for dyes. Even while this paper was being prepared, an article appeared on this very subject.[9]

These ideas usually concern the novel effects which may be produced by mixtures of chlorinated and normal wool yarns, the subsequent material being piece-dyed to give contrast effects. How useful such effects are likely to be in the future it is difficult to say, but it will be apparent from what has been said that similar effects may be obtained by the use of these hydrogen peroxide treatments, with greater latitude in finishing treatments. The mixture used may consist of ordinary wool and wool treated with hydrogen peroxide, in which case all the material will still be capable of taking a milled finish. Alternatively, by using mixtures of chlorinated wool and chlorinated wool treated with peroxide, a material can be obtained in which all the material is non-feltable. If a certain dye will give a contrast effect on mixtures of normal and peroxide-treated wool, then a similar effect will be given on mixtures of chlorinated and normal wool. The converse is by no means true, since the best contrast effects on the latter type of mixtures are obtained with dyes, possibly applied by dyeing methods in which the affinity for normal wool is poor.

Another case where methods for dyeing damaged wool equal to normal may arise, is envisaged in the proposal to take advantage of the differential milling shrinkage of fabrics made from chlorinated and normal wool. While in such fabrics advantage may be taken of the possibility of producing contrast effects in dyeing, it may also be desired to obtain solid shades. Selection of suitable dyes may permit this for a restricted range of shades, but treatment of the pieces by the hydrogen peroxide technique will enable a full range of solid shades to be dyed with fast dyes.

Apart altogether from correcting faults which have arisen due to lack of adequate control of prior processing, or of taking advantage of the changed affinity for dyes which particular treatments confer on wool, processes which are known to be relatively uncontrollable may be carried out in order to achieve desirable finishes. This is the case with wet chlorination processes, where the action occurs so rapidly as to make it extremely unlikely that the effect on the dyeing properties of the material will be an even one. The level dyeing of such materials is made more difficult, since it is obviously not worth while making the goods themselves withstand repeated washing, if at the same time the dyes used will not be fast to washing. The usual line of least resistance cannot therefore be followed, and the use of level dyeing acid dyes is barred to the dyer and finisher who desires to produce a high quality article. The obvious solution to this difficulty is to dye with fast dyes before chlorination, a solution which itself gives rise to many difficulties in matching, consequent upon the alteration of the ground shade of the wool during chlorination. Further, this method greatly restricts the dyer in his choice of dyes, since the dyes used must be fast to chlorination. For these reasons, therefore, methods for dyeing wet-chlorinated wool level with fast acid dyes and chrome dyes would be of considerable value, particularly at the present time when increasing quantities of anti-shrink material are being manufactured for the Forces. It was with the object of finding such methods that the work which led to the discovery of the benefits of hydrogen peroxide treatment was embarked on at Blackley. The applicability of this treatment to other forms of damage only appeared later and as incidental developments of the main topic.

There has perhaps been a tendency to regard the statement that chlorinated wool dyes more heavily than normal wool as almost axiomatic. This statement is based mainly on the results of the traditional anti-shrink process using mixtures of hydrochloric acid with sodium hypochlorite or calcium hypochlorite. Recently, advantages have been claimed for other chlorination media, and one of the more successful of these processes uses formic acid in place of hydrochloric acid. Material chlorinated under these conditions is not exactly like hydrochloric acid-chlorinated material in dyeing properties, and is not amenable to the hydrogen peroxide treatment in the same way. Such material has only been successfully dyed with a selected range of chrome dyes on a chrome mordant and, in heavy shades, with Coomassie Navy Blue 2RNS and Coomassie Fast Black BS. The wider problem of the reasons for these differences in dyeing properties still remains a new field for investigation.

SUMMARY

The effects on the dyeing properties of the wool fibers of carbonizing, peroxide bleaching and sulfur stoving on the one hand, and alkali damage, setting processes, anti-shrink processes and mildew, on the other hand, are discussed and co-ordinated. Methods of correcting material which is unevenly dyed due to improper control of these processes, and the precautions to be taken to tighten up the control, are described.

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The discussion which followed this paper appears on Page 343.

Britain's Dyestuff Industry in Wartime

By A BRITISH DYESTUFFS EXPERT

THE present war has proved that Britain can stand on her own feet as regards the production of all dyestuffs required for essential purposes during an emergency.

Immediately after the outbreak of war in 1939 the already existing Dyestuffs Advisory Licensing Committee became the Dyestuffs Control. The war, of course, at once began to make demands on such materials as toluene, benzene, glycerine, naphthalene and phenol — all materials used in dye making—and the Control's first job was therefore to see that the dyestuff industry received sufficient to enable it to carry on.

As it was not readily appreciated that color plays just as important a part in war as does an explosive, the Control had many difficult moments. People who were allocating supplies of these raw materials had to be told over and over again that while it was true that the Services must have ammunition, they must also have colored uniforms and equipment. Moreover, Britain had to supply also India, Canada, Australia, South Africa, and later, her Russian and Chinese Allies, in order that their Services could be equipped.

The Dyestuffs Control next cut out importation wherever possible. There was no Lend-Lease scheme in those early days, and money could not be found for non-essential foreign goods. Many dyestuffs and dyeing auxiliary products which had always been imported because of some special quality had to be done without.

The next question to which the Control turned its attention was the elimination of all wasteful use of dye. For instance, in peacetime a dyer might be called upon over a period to dye no less than 60 to 70 different shades of one color. This not only wasted color, but also time and labor. Suggestions were put to the Control that the number of shades permissible for use in home trade should be restricted, and when "Utility" clothing was at first discussed it was even suggested that only certain shades should be made available to this project. Instead, the Control took the line that if the depth of shade could be lightened all round, and pastel shades introduced as the fashion, a considerable quantity of dyestuff could be saved for more essential usage. The British Color Council was consulted and got to work on creating the public demand for lighter shades. This Council now sets the criterion for fashionable colors.

In the meantime the Control issued 23 orders restricting the depth of shade permissible in the dyeing of materials to be sold on the home market. Navy blues, nigger brown, bottle green, and deep scarlets as they had been known in Britain in pre-war days disappeared. Darkish materials can still be bought, but they are not dyed to the unnecessary depth which was fashionable before the war.

In this way many tons of dyestuffs were quickly saved and yet there has been no limit fixed in the choice of lighter shades available though labor shortage in itself soon forced the dyer to cut down the number of different shades of any particular color that he had been in the habit of giving to his customers. Generally speaking, brighter colors have been well received.

The Control then asked the Admiralty, War Office and Air Ministry to review their dyeing specifications for Service cloths. In the case of the Navy, for instance, it was shown that a navy blue can be obtained without a dyer giving such a heavy percentage dyeing. The soldier's overcoat need not have dyed pocket linings, and the blue overalls worn throughout the Services generally, as well as by munition workers, nurses and A.R.P. personnel, could also be lightened in shade. The Postmaster General agreed to lighten the color used on postage stamps, and the present stamp with its delicate coloring appeared.

The advent of the Lend-Lease Agreement affected the dye industry considerably. Materials imported under this agreement could only be used for essential war purposes and under guarantee that Britain's total production of such materials had already been similarly used. On several occasions it has happened that perhaps for the production of some drug required by the Services Medical Corps, the Ministry of Supply has imported under this agreement some chemical which has been produced on a small scale for use in the dyestuffs industry. The effect of this has been that the production of the dyestuffs dependent upon that chemical have immediately had to be cut out except to the extent to which it could be proved that the dyestuffs themselves were being used in the production of some vital material. Other colors which chemists have found they could produce have had to be shelved because the necessary raw material has been obtained through the Lend-Lease Agreement.

Another problem has been the procuring of packing materials necessary for the distribution of dyestuffs, particularly in fine powder form. Steel drums, plywood kegs, corrugated cardboard, and paper have all been difficult to obtain.

The dye users' greatest worry in 1939 was the prospect of a price ramp such as occurred during the 1914-1918 period, and it was at their request, in agreement with the dyemakers, that the Dyestuffs Advisory Licensing Committee became the Dyestuffs Control. Under Government orders it at once became illegal for anyone to sell or transfer any dyestuff, either British or foreign, except under license. Every dye maker, dye user, and dye merchant—approximately 1,400 firms in all — were placed on the Control Register, and by a system of sales-licensing, particularly in the case of imported colors, no matter how many times a product legally changed hands it could be traced, and in every instance the price controlled.

In actual fact, the Dyestuffs Control has never, since the war began, been called on to put a check on any dyemaker's prices. The makers themselves, in spite of increasing costs, have voluntarily kept the prices on the home market low, and they are today only 35 per cent above the 1938-1939 level.

The Control confines itself as far as possible to suggesting a course of action and leaves individual manufacturers as much freedom as possible within the framework of the agreed policy. Each manufacturer has received an open license to trade, thus eliminating much form-filling, and the most which has been asked for by the Control has been periodical returns showing how materials have been disposed of, and the acceptance of guidance as to the Board of Trade policy and priority claims upon total production. The latter have, of course, changed very little and have been as follows:—

(1) Home and Allied Government (Services) demands,

(2) Textile export trade demands,

(3) Home civilian demands, and,

(4) Overseas civilian demands.

It will be noted that home civilian demands have been catered for before any question of exportation has been approved, except exportation to the Allies for direct war purposes. Owing to the fact that, India, South America, Spain, Portugal, Palestine and the Middle East generally bought the bulk of their dyestuffs from Germany prior to the war, their demands upon Britain and America for supplies have been very heavy, but it was considered unwise to drain the home market of color in order to meet these new demands.

Altogether, the benefits derived from control by both dyestuff producers and users have been so many that it seems more than likely that the maintenance of a Board of Trade Dyestuffs Section after the war will receive general approval.

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STUDENT CHAPTERS

Lowell Textile Institute
North Carolina State College
Philadelphia Textile Institute
New Bedford Textile School

Members should notify the **Secretary** immediately of all address changes.

AATCC PERSONNEL SERVICE

Annual Meeting, Atlantic City, October 12-14, 1944

THIS new service, free to all corporate, individual and student members of the A.A.T.C.C., will be inaugurated at the National Meeting in Atlantic City, October 12-14, 1944. It is an important addition to the increasing program of the Association promoting the technical, scientific and professional interests of its members.

The A.A.T.C.C. Personnel Service will be patterned after the highly successful Employment Clearing House of the American Chemical Society, with appropriate modifications to meet the needs of A.A.T.C.C. members. The Association is deeply indebted to the American Chemical Society for its generosity in supplying detailed information relative to the operation of its Employment Clearing House. Many A.A.T.C.C. members have made use of the A.C.S. service, and have found it to be valuable, convenient and efficient in bringing together candidates for employment and prospective employers. It is hoped that the new A.A.T.C.C. service will prove equally successful.

WHO MAY USE THE SERVICE

The service will be available to all members of the Association attending the National Meeting. The following classes of employers and candidates for employment should find the service particularly useful.

EMPLOYERS

1. Textile mills seeking laboratory and plant personnel for executive, production, control, research, design, and similar positions.

2. Research institutes, consulting laboratories and similar organizations seeking all types of technical personnel.

3. Educational institutions seeking staff members, graduate assistants, research associates, etc.

4. Suppliers of chemical products such as dyestuffs, auxiliaries, finishing agents, heavy chemicals, etc., to the textile industry, seeking personnel for sales, technical service, product development, research and similar activities.

5. Manufacturers of synthetic fibers seeking technical personnel, particularly for sales, technical service, product development, production control, and research activities.

CANDIDATES FOR EMPLOYMENT

1. Newly-graduated chemists and engineers seeking employment in the various types of organizations listed under "Employers." The service will be particularly valuable to candidates from schools which do not assist their graduates in securing employment in the textile and related industries.
2. Candidates with experience in other technical fields seeking connections in the textile and related industries.
3. Candidates now employed who wish to make a change for any one of a variety of reasons such as lack of opportunity in present connection, desire to move to a new locality, obvious misplacement, etc.
4. Students who will complete their studies within the next year. It is particularly anticipated that registration with the Personnel Service and attendance at the National Meeting will provide such students and interested employers with an excellent opportunity to make preliminary arrangements for employment upon graduation.
5. Men returning from military service seeking employment or re-employment in the textile and related fields.

HOW THE SERVICE WILL FUNCTION

Space will be reserved at the National Meetings for the exclusive use of the Personnel Service. At the Atlantic City Meeting, this will consist of an adequate room at the Hotel Claridge. This space will provide the following:

1. A section where candidates for employment may fill out the necessary forms.
2. A section where employers may review the records of the registered candidates for employment.
3. A section devoted to the routine details of registering employers and candidates, accepting application forms from candidates, scheduling interviews, etc.
4. A section devoted to the private interviews of employers and candidates.

The Personnel Service will operate on the following schedule at Atlantic City:

Thursday, Oct. 12—2:00-5:00 p.m.—Registration of employers and candidates.

Friday, Oct. 13—9:00 a.m.-noon—Registration and Interviews.
2:00-5:00 p.m.—Registration and Interviews.

Saturday, Oct. 14—9:00 a.m.-noon—Registration and Interviews.
2:00-5:00 p.m.—Interviews only.

The following procedures should be followed by Candidates for Employment and Employers:

CANDIDATES FOR EMPLOYMENT

Candidates for employment will prepare, in duplicate, a standard Qualification Form. This form may be obtained at any time prior to the meeting from Dr. H. C. Chapin, Secretary of the A.A.T.C.C., Lowell Textile Institute, Lowell, Mass., or can be obtained at the Meeting. It is urged, however, that the forms be prepared and filed with the secretary prior to the meeting, if possible, in order that a maximum of time shall be provided for employers to study the records of the available candidates and schedule interviews.

The candidate for employment will register with the Personnel Service at the National Meeting as early as possible. A notification system will be established whereby candidates will be advised of requests for interviews by interested employers. They will present themselves at the appointed times for these interviews at the section devoted to this purpose. Here they will meet with the prospective employers and during the private interviews will make any further arrangements relative to employment, visits to the employers' establishments, etc., that seem desirable.

EMPLOYERS

The employers or their representatives need no arrangement prior to the meeting. However, they should register with the Personnel Service as early as possible during the meeting. The qualification records of the candidates will be classified in a convenient manner, and will be available for inspection by the employers in space reserved exclusively for this purpose. From these records, the employers will prepare a list, on a form supplied for the purpose, of candidates whom they wish to interview. This list will be presented to an attendant, who will immediately

prepare an interview schedule convenient to the employer and the candidate listed. Thirty-minute periods will be assigned for each interview. Every possible effort will be made to assure attendance of the candidates at the appointed interviews. Interviews requested before noon can be scheduled for the same afternoon, and those requested in the afternoon can be scheduled for the following morning.

When interviews are scheduled, the employers will report to the section reserved for this purpose, and will be provided private facilities for conducting the interviews, the employers may make any suitable arrangements with the candidates for further interviews and visits to the employers' establishments, make formal offers of employment, etc.

RULES

In fairness both to employers and candidates, it is necessary to impose a few simple rules. In addition, the A.A.T.C.C. requires certain information in order properly to evaluate the service and to make modifications at future meetings. It is urged that the following rules be observed:

1. Use of the service shall be restricted to corporate, individual and student members of the A.A.T.C.C.
2. Candidates and employers must report promptly for all scheduled interviews. Further interviews may be cancelled when candidates accept employment or employers secure the necessary personnel.
3. Candidates for employment must fill out qualification records as completely as possible. They *must* provide the following information, as requested on the blank:
   a. Whether the registration as a candidate is made with the knowledge of the current employer, if employed.
   b. Whether the registrant is free to change his employment under current manpower controls.
4. Candidates must report promptly to the Personnel Service acceptance of an offer of employment.
5. Employers must report the name of each candidate employed as a result of an interview scheduled through the Personnel Service.

Failure to observe the above rules may result in barring candidates or employers from further use of the Personnel Service.

In addition to the above, it is requested but not required that the following be reported to the Personnel Service:

1. Candidates report the number of offers of employment received as a result of interviews arranged by the Service. The identity of the employers making the offers and the nature of these offers *should not* be reported.
2. Employers report the number of offers of employment made as a result of interviews arranged by the Service. The candidates to whom the offers were made and the nature of the offers *should not* be disclosed.

Obviously the above requests are made in order that information can be accumulated as to the usefulness of the Personnel Service to Association members.

In many instances the interviews at the National Meeting may be followed by further interviews, and actual offers and acceptances may not materialize until some time after the National Meeting. For this reason, the responses to the above requests may be made by mail to the Secretary subsequent to the Meeting.

SUGGESTIONS

The service is being established at this time with no information as to the possible number of interested employers and candidates at the Atlantic City meeting. For this reason, it will be of great assistance if candidates for employment will request forms from the secretary and file them as early as possible. Likewise, employers are invited to write the secretary as soon as possible indicating their intention of utilizing the Personnel Service. The receipt of such information prior to the meeting will assist in providing adequate facilities and personnel for the Service, avoid confusion, and indicate the degree of interest and potential usefulness of the Service.

All suggestions as to methods of conducting the Service will be welcomed. They should be addressed to the Secretary.

MISCELLANEOUS

A few principles involved in the establishment of this Personnel Service should be emphasized:

1. The Association will accept no fees in connection with this Service, and will perform none of the usual functions of a commercial employment service.
2. The Association will take no responsibility for information contained in the qualification records of the candidates for employment.
3. The primary purpose of the Personnel Service is the provision of a convenient method by which employers and candidates for employment may meet and discuss possible employment arrangement on a private basis.
4. Interviews shall be conducted on a proper ethical basis. Unidentified employers' representatives and candidates for employment may not use the Service.

This new service should be an important feature of the Atlantic City and future national meetings. If the Personnel Service proves successful, consideration will be given to its operation on a year-round basis, perhaps in conjunction with Sectional Meetings or through permanent files in the office of the Secretary. The members of the Association are urged to give this Personnel Service a trial at Atlantic City.

DR. MILES A. DAHLEN,
Chairman,
Personnel Service Committee.

MEETING, SOUTH CENTRAL SECTION

THE June meeting of the South Central Section was held Saturday evening, June 17, 1944 at the Patten Hotel in Chattanooga, Tennessee.

Dinner was served at 7:00 p.m. and attended by sixty guests and members. The guest speaker of the evening was R. C. Harnden, of the Dow Chemical Company, Midland, Michigan. He gave an interesting address on "Microbal Control in the Textile Industry."

A special feature of the program was a talk by Jack Anderson, Peerless Woolen Mills, Rossville, Georgia. His subject was "Highlights on South America, and How South American Wool Has Fitted Into the American War Effort."

The Chairman appointed a committee to raise funds for the expense of a speaker to deliver our sectional paper, at the national meeting in Atlantic City. The committee consists of:

Jack Anderson, H. A. Rodgers, Malcolm McKenzie, Andrew Kelly.

Respectfully submitted,
R. W. FREEZE,
Secretary.

MEETING DATES, PHILADELPHIA SECTION

AT A meeting of the officers of the Philadelphia Section, held on July 14th, it was decided to hold meetings on the following dates during the 1944-45 season: September 29th, November 17th, January 12th, February 23rd, April 6th.

Committee Chairmen for

ANNUAL MEETING

Atlantic City, New Jersey, October 12, 13, 14, 1944
Auspices of Philadelphia Section

Dr. Glen S. Hiers
Collins & Aikman Corp.
CHAIRMAN,
TECHNICAL PROGRAM COMMITTEE

PLANS are well underway for the annual meeting to be held at Atlantic City, N. J., on October 12th, 13th and 14th, under the auspices of the Philadelphia Section. Emphasis this year will be placed on the technical program, the committee for which is under the chairmanship of Dr. Glen S. Hiers of Collins & Aikman Corp.

A special feature of the meeting will be the inauguration of a personnel service. Information concerning this service appears in this issue.

Charles A. Seibert of E. I. du Pont de Nemours & Co., Inc., is chairman of the general committee on arrangements.

Shown on this page are a number of the chairmen of various committees. Other photos appeared in the last issue.

Lloyd O. Koons
Scholler Bros., Inc.
CHAIRMAN,
RECREATION COMMITTEE

Col. Frank M. Steadman
Philadelphia Quartermaster Depot
VICE-CHAIRMAN, TECHNICAL
PROGRAM COMMITTEE

Harold B. Dohner
Amalgamated Chemical Corp.
CHAIRMAN, REGISTRATION
and RESERVATION COMMITTEE

Arthur W. Etchells
Hellwig Dyeing Corp.
CHAIRMAN,
EXHIBITION COMMITTEE

CALENDAR
OF COMING EVENTS

Meeting, Southeastern Section, Callaway Institute, La Grange, Ga., September 9, 1944.

Annual Meeting, Hotel Claridge, Atlantic City, N. J., October 12, 13 and 14, 1944. Auspices of Philadelphia Section.

Meeting, Rhode Island Section, September 29, 1944.

Meeting, Philadelphia Section, September 29th, 1944

Note: Secretaries of local sections are requested to advise the AMERICAN DYESTUFF REPORTER of meeting dates for the 1944-45 season as soon as available.

A. P. HOWES
Publisher

MYRON D. REESER
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AMERICAN DYESTUFF REPORTER

LOUIS A. OLNEY, D.Sc.
Directing Editor

NORMAN A. JOHNSON, B.T.C.
Managing Editor

VOLUME 33 | **JULY, 31, 1944** | **NUMBER 16**

United States Tariffs

ACCORDING to the results of a study recently made public by the American Tariff League, United States tariffs, contrary to opinions recently expressed in many quarters, are actually among the lowest of the world's trading nations. The study was three years in the making.

In commenting on the report, Bertrand W. Hall, league secretary, said: "A number of statements have been made recently which have given rise to the popular misconception that American tariffs are higher than most other countries. These statements are apparently based on a widespread lack of information on the subject—a lack which the League's report, a thoroughly objective one, should help to correct."

Comparative averages (using figures for 1937, the last full year before World War II for which statistics are available), taking the United States as 100, are as follows:

Spain	465	Switzerland	128
Turkey	359.6	United Kingdm.	118.3
Germany	279	Argentina	110
Brazil	239.4	**United States**	**100**
Greece	166	Japan	98
Hungary	160	Belgium	96.8
Italy	150.5	France	85
Mexico	149	Canada	76.3
Egypt	130	Netherlands	37.4
		Sweden	32.8

As the above table indicates, out of 19 countries studied, the United States tariffs rank 7th from the bottom. Comparisons were based on import duties charged against a theoretical ship's cargo made up of 170 commodities, divided into 10 groups. The Soviet Union was omitted because it operates under a closed economy and the necessary data were not available.

Commodities figuring in the analysis fell into the following major groups: farm products, foods, hides and leather products, textile products, fuels, metals and metal products, building materials, chemicals, house furnishings, and miscellaneous. In the textile products group were included: burlap, unbleached cotton cloth, bleached cotton cloth, dyed cotton cloth, cotton collars, cotton hosiery, cotton overalls, cotton shirts, cotton underwear, cotton yarn, linen handkerchiefs, raw silk, rayon staple, rayon piece goods, rayon yarn, silk hosiery, wool overcoats, wool piece goods, wool suits, wool underwear and wool yarn. In the chemical group were included: ethyl alcohol, methyl alcohol, aluminum sulfate, ammonium sulfate, camphor, caustic soda, citric acid, cocoanut oil, copra, creosote oil, indigo dyes, direct black dyes, sulfur black dyes, vat blue dyes, fertilizer, glycerin, nitrate of soda, phosphate rock, crude potash, muriate potash, sulfate potash, salt, soda ash, sulfur, superphosphate, tallow, and tankage.

The following tables show the comparative treatment accorded the textile products and chemicals groups by the various nations. All of the per cent figures are equivalent ad valorem rates.

TEXTILE PRODUCTS	PER CENT
Spain	316.1
Turkey	163
Brazil	117.6
Mexico	86.8
Greece	58.8
Germany	55.2
Switzerland	40
Canada	39.8
Hungary	37.4
United States	**32.3**
Argentina	31.2
Japan	30
France	22.7
United Kingdom	21.2
Belgium	19.3
Egypt	19.1
Sweden	18.9
Italy	15.3
Netherlands	7.6

CHEMICALS	PER CENT
Mexico	295.8
Spain	143.4
Turkey	85
Greece	74.5
Germany	73.2
Brazil	30.3
Argentina	24.4
Japan	16.7
France	15.9
Egypt	15
Canada	13.7
United Kingdom	13.3
Hungary	13.2
United States	**12.1**
Italy	11.4
Switzerland	10.1
Netherlands	7.8
Sweden	2.8
Belgium	1.3

Commenting on the thoroughness of the study, Mr. Hall said: "The utmost care was exercised in determining a fully representative cargo. Commodities were selected on the basis of their consumption in the United States. Amounts and prices of commodities were based on the total quantities and value of each in the combined exports and imports of both the United States and the United Kingdom."

The result, Mr. Hall indicated, showed clearly that this country was far from the top in the matter of tariffs. In half the categories studied—food, fuels, metals, building materials and chemicals—the United States is in the bottom six.

The American Tariff League is a non-partisan, fact-finding organization founded in 1885, Mr. Hall declared, "to carry on continuous research into all the facts and forces brought into play in trade between the nations, and to make these facts available in an educational effort designed to provide a better understanding of the effect of

these forces on the prosperity of American labor, agriculture and industry."

There are other factors to be considered to show the true picture such as in the case of government monopoly on certain products where no duty would be listed but free entry would be only a theory because, unless the shipment is for the account of the monopoly, there would be no shipment. In other countries, imports of certain products are prohibited and naturally no amounts would be shown as having been collected in duty. In the calculations used in the study, the products were assumed to enter duty free and the final figures showing relative height of tariffs are much more favorable to the country having these restrictions than is actually the fact.

In considering the question of foreign trade after the war, the results of this study can well be investigated by American manufacturers.

NEW PROBLEMS

J. E. BULLARD

AMONG the things this war has done is to enable more Americans, than even before, to see more of the rest of the world. They have been on every continent, more and more of the Pacific islands, have lived in every climate and had an opportunity to study natives who, in times of peace, they might not even read about. Out of this has come a more comprehensive knowledge of the rest of the world and ideas for making that knowledge pay.

Consequently, men will come back with marketing ideas, design ideas, new materials and new products ideas. Millions of Americans cannot be scattered throughout the world, especially in parts they never expected to see, without gaining and applying new knowledge. This is going to influence our future and is rather certain to give rise to special and new demands for dyes, those suited to solve postwar problems.

Our dye, chemical and rayon industries date from the last war. In this war industries are being started or are gaining a firmer foothold. The production of synthetic rubber, of aluminum and of magnesium has been greatly expanded. It is going to require a lot of research together with what our men overseas are doing either consciously or subconsciously to develop the new products and find markets for them which will be needed to keep all our increased producing capacity busy. Dyes are bound to play a part in this progress.

Speed in production is going to be a more important factor than it ever has been in the past and one of the problems will prove to be suitable color finishes. Dyes which impregnate the material, which give built-in color, perhaps used in the process of producing the material offer great promise. Laminated materials will be used more and more and be composed of such materials as wood, sheet plastic, paper, fabrics, metals, etc., the final lamination being composed of a combination of two or more of these or of just one kind. Dyes are almost certain to play a more and more important part in the exterior finishes.

Much progress is being made in the chemical impregnation of such hydroscopic materials as wood, paper, fabrics, etc., so that the internal moisture content remains constant and dimensions do not change as the humidity of the air to which they are exposed changes. Here, again, is a field for dyes to give the final desired color finish to products made of these materials. This treatment of such materials also extends their use in laminated construction.

Undoubtedly, there will be a number of new synthetic fibers developed after the war and each will present its own special dye problems. Also, it is possible, some natural fibers used but little or not at all in the past will be used more in the future. Those millions of our best young men who are scattered throughout the world have their eyes and ears open and they have minds which are alert. Not until they come home will we know how many new ideas they will bring back both in regard to materials and markets. Among other things, however, we can expect them to come back with new dye problems.

During the war, we have been forced to give more attention to waste and salvage than has been our habit in the past. Wood waste, including sawdust, presents a problem which never has been solved satisfactorily. Research plus the most effective use of plastics and dyes gives promise of solving not only this waste problem but of the waste of many other organic materials as well.

Many of our most used materials of the past have presented real difficulties in regard to exterior color finishes. Some of the finishes used are easily scratched, chip, crack or flake off. They frequently have to be renewed. Dyes appear to be the solution of this problem. If they impregnate the material far enough below the surface, scratches will not show to any degree. There will be no chipping, flaking or cracking. Soap and water can be substituted for the present paint and brush in redecorating the home.

The export business we do after this war may hold a great many surprises. In addition to such work as picking up new ideas, getting better acquainted with customs of the natives, acquiring first hand knowledge of possible markets, our men overseas are doing a lot of missionary work. They are preparing the way for the full development of many new markets we never may have considered in the past. There is a good chance the volume of business we do in the Pacific area will be greater than may seem possible now. It will be large because the men who come home will know at first hand what the peoples in the Pacific areas want. There will be little or no guess work about it. They will have observed the colors and the color schemes which are popular. They will know what products are most likely to sell in volume and which are not. They will know what changes will have to be made in our present products to make them suitable for each export market under consideration.

Air transportation is going to bring to our doors markets which were so distant before the war they were hardly considered. Though the actual products may not be transported by air, except in emergencies, salesmen, service men and others connected with marketing can reach by air, places which required too much travel time to be considered in other days. After no other war have conditions been so favorable to the developing of world-wide new markets for our products as they are bound to be when the present war is over. This war has provided opportunities for making world wide marketing

surveys, has developed transportation facilities by air and by sea, has resulted in valuable missionary work. The degree to which the trade develops will depend upon how wisely and how effectively the knowledge gained is used and the energy and the speed with which the markets are developed by producing and selling that which will prove the most satisfactory to all our new customers.

One of the greatest problems is going to be to make the best possible use of the knowledge which the returning men and women bring back. In the case of some of them, that knowledge can be used best in the sales department, in the case of others in production, of others in design and of still others in research. The knowledge is going to be there. If it is used effectively, it will help to increase the volume of business done in this country as well as prove of tremendous value in developing export markets. Let a research worker in dyes talk to a hundred or more of those who return from overseas after the war and the chances are good he will be greatly surprised when he realizes how much he has learned from these talks.

• BOOK REVIEWS •

THORPE'S DICTIONARY OF APPLIED CHEMISTRY. Fourth Edition. Volume VI. (GLAU-INV). Pages 611. J. F. Thorpe and M. A. Whitely. Longmans, Green & Co., New York. Price $30.00.

Volumes I, II, III, IV and V were reviewed with considerable detail in the November 29, 1937, November 13, 1939, October 14, 1940 and July 6, 1942 editions of the AMERICAN DYESTUFF REPORTER.

While designated as a dictionary, this is the most complete encyclopedia of applied chemistry that has been published up to the present time, in fact, upon certain individual subjects, it constitutes almost a text book.

More and more applied chemistry involves a fundamental knowledge of physical chemistry, and the Board of Editors has given full cognizance to this fact. For instance, the current volume contains extended sections upon Homogenous Catalysis, Hume-Rothery's Rule, Hydration of Ions, Hydrogen Ion Determination, Hydrogenation Mechanism, Hydrolysis and Inhibitors.

Subjects of special interest to textile chemists and colorists have been especially well covered in previous volumes. This volume devotes 25 pages to Indigo, and the indigoid dyes.

One valuable feature of the present volume is a complete index of all subjects covered in the first six volumes. An examination of the list of 65 contributors, published at the beginning of the volume indicates the general excellence of the material which it contains.

In our opinion Thorpe's Dictionary of Applied Chemistry will continue to hold a most important place on the shelves of all chemical libraries because it fills an important need which cannot be found in any other set of books.

ANCIENT and MEDIEVAL DYES by William F. Leggett. Published by Chemical Publishing Co., Inc., Brooklyn, N. Y. Price $2.25. 95 pages.

Although coal-tar dyes have almost completely replaced the natural dyes, both of vegetable and animal origin, they became of considerable importance during the first World War and were quite extensively used at that time.

Owing to the fact that the American dye industry has developed to such an extent that the United States is practically self contained as far as an essential dye industry is concerned, the ancient and medieval dyes have played little if any part in the present war.

These dyes, described by the author as ancient and medieval are nevertheless of great interest from a historical point of view and every educated and trained dyer should be familiar with their history. The author has presented a book which reads easily and will be found to be entertaining and instructive. It describes the development of dyes by ancient and primitive people and explains how they found their coloring materials largely by accident in the sap of berries, nuts, roots, plants, shrubs and trees; and in insects and fish. The expert on dyes, as well as the general reader, will find this book both educational and entertaining.

SOYBEAN CHEMISTRY and TECHNOLOGY by Klare S. Markley, Southern Regional Research Laboratory and Warren H. Goss of the Northern Regional Research Laboratory. Published by the Chemical Publishing Co., Brooklyn, N. Y. Pages 261. Price $3.50. 1944.

Among the developments of the past few years both agriculturally and industrially, that of the soybean is outstanding. From an insignificant production ten years ago, 1943 shows a total of 209 million bushels. Its uses are multitudinous. As a foodstuff it is outstanding, the oil has replaced cottonseed oil in many cases. Various products obtained from it e. g., the phosphatides have found use in the textile industry. Experimentally at least, textile fibers of a protein nature have been spun from its products on the rayon system.

There has been a great demand for more scientific information regarding the chemistry and technology of the soybean and its products. This volume will fill that demand. Not only does it cover the subject very well but there are 477 references in the literature cited which may be followed up by those sufficiently interested.

TRADE NOTES • NEW PRODUCTS

• APPOINTED COLGATE DISTRIBUTORS

The Colgate-Palmolive-Peet Company announces the appointment of Marlowe Van Loan Corporation of High Point, North Carolina, as distributors of their products to the textile trade in North and South Carolina and part of Virginia.

Held in high esteem by a large following of textile manufacturers Marlowe Van Loan Corporation will provide added service on C.P.P. textile processing agents in the territory in which they are active.

• CELFON

Donald M. Martin, in charge of Sales of Auxiliaries for General Dyestuff Corporation, has announced the offering of a new alkali soluble cellulose known as Celfon. This product is obtained by dissolving pure cellulose in a catalytically activated caustic soda. Celfon is available in solution or concentrated form in a wide range of viscosities.

Celfon may be used on cotton yarns as a permanent prefinishing or sizing. When applied to cotton fabrics, it is said to produce a permanent finish, meeting requirements of the U. S. Quartermaster Corps, and in addition, increased tensile strength and resistance to abrasion.

It is stated that, on viscose rayon, acetate rayon, wool and blends thereof, Celfon has been found to stabilize the fabric, minimize slippage, and increase its strength and resistance to abrasion.

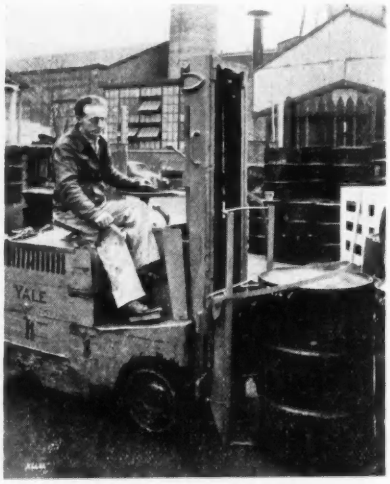
It is claimed that laboratory tests have shown that the degree of permanence of

Celfon treated fabrics, is remarkable, numerous washings or dry cleanings having no effect on its durability. In fact, when boiled for hours in alkali, there is said to be no perceptible loss of finish.

Celfon may be used in conjunction with pigments, dyestuffs, fillers and other materials to obtain permanent and unique effects.

● HANDLING DRUMS

Certain types of industries, particularly those involving the handling of chemicals, gas and oil, paint and similar materials in metal drums or barrels, are said to report unusual economy, speed and efficiency through the use of the Yale Telescopic Tilting Fork Truck equipped with a removable barrel handling device.



Yale Telescopic Tilting Fork Truck

This addition has special short forks and a metal loop which is dropped over the barrel or drum by lever action after the forks have been slid underneath. This device enables the operator to pick up barrels and drums and transport them in and out of cars and storage without stepping off the truck. In effect, one man is said to do the work of several, moving many containers in an hour's time with speed and safety. When the job is completed, the barrel handler is removed, the regular forks are replaced and the truck resumes its routine materials handling functions—lifting and moving and high-stacking skid and pallet loads in and out of storage.

● JOINS ALTHOUSE CHEMICAL

Charles F. Hollenbach has been appointed a New England representative for the Althouse Chemical Company at 86 Weybosset St., Providence, R. I. Mr. Hollenbach was formerly connected with the Appeals Branch, Dyestuff Division, of the War Production Board, Washington, D. C. He is a graduate chemical engineer from Lehigh University and has been identified with the textile industry for many years.

● NEW SAFETY RECORD

A new world's safety record of more than 16,000,000 man-hours, covering a period of 57 months with no lost-time injuries was anounced recently by Col. John Stilwell, president of the National Safety Council.

This mark, breaking the previous world's record which stood for four years, was established at the Seaford, Del., nylon plant of E. I. du Pont de Nemours & Co. One thousand, eight hundred and fifty workers have been employed there on the average since 1940. The plant has suffered no lost-time injuries since operations started Oct. 2, 1939.

Colonel Stilwell, who made the announcement on "The Cavalcade of America" radio program, presented the National Safety Council's "Award for Distinguished Service to Safety" and the Council's "S" pennant to W. L. Stabler, manager of the plant.

● NEW PHOSPHORESCENT PIGMENT

A new phosphorescent pigment, which emits a brighter phosphorescent afterglow for a longer period of time than similar long-afterglow pigments, was recently announced by The New Jersey Zinc Sales Company. This pigment (designated CaS-SrS-2470) is specifically intended for use in such wartime applications as phosphorescent paints, marking tapes and decalcomanias, but unquestionably will find many peacetime uses. It is priced to sell at from $1.25 to $1.50 per pound, depending on the quantity purchased.

At the same time, this Company announced a reduction of 50c a pound on two standard long-afterglow phosphorescent pigments, namely pigments CaS-SrS-2487 and CaS-SrS-2440. The new price of the former (2487) is from $1.00 to $1.25 per pound and the latter (2440) from $1.50 to $1.75 per pound, depending on quantity bought.

● NEW DEVELOPMENTS BY MONSANTO

New developments in the chemical treatment of fibers which will have an effect on the postwar textile industry were announced recently by Monsanto Chemical Company.

As a result of long research in its Dayton and Boston laboratories dealing with chemical treatment of natural fibers, the company announced that its accomplishments to date include:

Treatment of wool so that it won't shrink.

Treatment of both cotton and wool so that the wearing qualities of these fabrics will be doubled.

Treatment of serges to eliminate the shine from the cloth.

Treatment of wool so that it creases under steam and heat and then creases durably. Thus trousers or suits that are pressed will retain the crease even in a rain and will not wrinkle when packed into a suitcase.

Treatment of fibers so they will not slip. This means that stockings will not run nor seams pull out.

All of these developments, it was announced, are based on new techniques of treating either the surface or the heart of fibers to produce the desired effect without in any way changing the feel or texture of the material. In some cases the treatment involves the deposit of a submicroscopic film of plastics. In the case of the elimination of runs in stockings, the treatment involves the deposit of silica or submicroscopic grains of sand which prevents the fibers from slipping out of the positions into which they were knitted yet does not alter the feel or texture of the fabric.

Part of a long range research program into the chemical treatment of textiles, the results up to now are said to include greatly increased water-repellent qualities for cottons and rayons and increased fastness to washing or dry cleaning through impregnation with chemicals which are highly resistant to heat, water and acid.

Many of the developments are being applied to war materials, and civilian uses on some will have to await the war's end, it was announced. The treatments are considered highly significant in their application to many G.I. army items.

● FIRST ALL-CELANESE RUG

The first all-Celanese rug is now being introduced by M. J. Whittall Associates, Inc., as the new Celanglo Wilton.

"Its outstanding excellence," says the 'Whittall Shuttle,' "is due to the Celanese yarns which are used. These are unusually brilliant with a natural sheen which will not wear off or deteriorate. These yarns are mothproof and also flameproof. They withstand rigid tests for durability and fastness of colors. Celanglo rugs seek comparison only with the very highest grades of carpet fabrics."

● U. S. LETTERS PATENT GRANTED

Dr. Camille Dreyfus, president of Celanese Corporation of America, this week was granted United States Letters Patent No. 2,353,224 and 2,353,225, relating to window screens.

• DR. OLNEY MADE PROFESSOR EMERITUS

On the occasion of his retirement as head of the Department of Chemistry and Textile Coloring at the Lowell Textile Institute, the Board of Trustees of the Institute conferred upon Dr. Louis A. Olney the title of Professor Emeritus. A reproduction of the letter from the President of the Institute, Charles H. Eames, appears at the right.

Louis A. Olney

The Commonwealth of Massachusetts
Department of Education
Lowell Textile Institute
Lowell, Mass.

Office of the President

July 10, 1944

Dr. Louis A. Olney,
Lowell Textile Institute,
Lowell, Massachusetts.

Dear Dr. Olney:

The Board of Trustees at its last meeting voted to request me to express to you its grateful appreciation of your long term of faithful and enthusiastic service to the Institute as Head of the Department of Chemistry and Textile Coloring. During the forty-seven years which were concluded in accordance with the retirement provisions of State law, you have by your ability and constant endeavor developed and expanded the curriculum of the department and thereby not only added to the prestige of the Institute but have made valuable contributions to the field of Textile Education.

While this long association as a member of the faculty of the Institute can be officially severed the mutual interest and cooperative goodwill should not. The Board recognizes this spirit by conferring the title of Professor Emeritus upon you and with it the hope that happy relationships will continue throughout the coming years of your life which we trust may bring good health and contentment.

Yours very truly,

Charles H. Eames
President

CHE:HGF

Following his graduation from Lehigh University in 1896, Dr. Olney served one year as an instructor in the chemistry department at Brown University and then became professor of chemistry and dyeing and director of that department at the Lowell Textile Institute. He has held this position continuously until his retirement on July 1st of this year.

When he first joined the staff at Lowell the school was situated in a somewhat undesirable location in downtown Lowell. Shortly thereafter the school was moved to its present site on the banks of the Merrimac on upper Moody Street. Just recently, owing to the persistent efforts of Dr. Olney, a new wing, known as the Louis Pasteur Hall, was added to the chemistry and dyeing department.

It is no exaggeration to state that, of the long succession of students who have attended Dr. Olney's lecture classes, there is probably at least one representative in every dyeing and finishing plant in the country, as well as a long list of those who have gone with dyestuff and chemical manufacturers, testing and service laboratories, synthetic yarn manufacturers, etc. Many of the most responsible positions in the industry are held today by former students of Dr. Olney.

Dr. Olney has been directing editor of the AMERICAN DYESTUFF REPORTER practically since its inception in 1920, and shortly thereafter, following an editorial campaign in the REPORTER, he invited a number of outstanding men in the textile chemical field to attend a meeting in Boston (on August 26, 1921) to consider plans for forming an American association of chemists and colorists. The inaugural meeting was held in Boston on November 3rd, 1921 and Dr. Olney was elected the first president. The growth of the A.A.T.C.C. from a membership of about 250 to its present membership of about 3,400 is a tribute to the work and character of its first president. His activities on behalf of the Asociation are well known and appreciated by the readers of the REPORTER.

Dr. Olney is also an active member of other associations in the textile and chemical field, including the following: American Chemical Society, Textile Research Institute, Inc., American Institute of Chemical Engineers, American Institute of Chemists, American Association for the Advancement of Science, the British Society of Dyers and Colourists, and the British Society of Chemical Industry.

Dr. Olney also holds positions with the Lowell Morris Plan Co., the Lowell Institute for Savings, the Wannalancit Textile Co., is an assistant editor of *Chemical Abstracts*, a director of the Howes Publishing Co., Inc., and serves in a consulting capacity for several companies in the textile and chemical field.—N.A.J.

• CELANESE PATENT

Celanese Corporation of America this week was granted United States Letters Patent No. 2,348,781 which relates to the production of laminating fabric for adhesively uniting components of a composite fabric.

According to the invention such a laminating fabric is prepared by applying to a fabric containing fibers of non-thermoplastic material in admixture with fibers of cellulose acetate or other organic derivatives of cellulose as plasticizer for the organic derivative of cellulose.

The thus treated fabric is aged at an elevated temperature in an atmosphere having a relative humidity of at least 70 per cent which causes at least part of said plasticizer to migrate from the non-thermoplastic material to the cellulose acetate material.

This migration of the plasticizer from the non-thermoplastic material to the cellulose acetate material not only improves the adhesion when this fabric is used in the manufacture of stiffened composite fabrics such as collars, but also eliminates the greasiness and discoloration due to the sweating of the plasticizer from the non-thermoplastic fibers.

● TEXTILE RESEARCH INSTITUTE LUNCHEON

The Research Fund Committee of the Textile Research Institute met recently at a luncheon held in connection with the current membership drive of the Institute where a report on the future aspects of the campaign and a survey of the results achieved thus far were discussed.

Dr. Harold De Witt Smith addressed the meeting on the plans to further the steps being taken to complete the recently acquired property of the Textile Research Institute at Princeton, N. J., into laboratories for the conduction of industry-wide research.

● PROCTER & GAMBLE BOOKLET

The Procter & Gamble Company, Cincinnati, Ohio, have recorded in a book entitled, "Into a Second Century," their growth from a small soap-and-candle factory to one of the major industrial corporations of the country. It reflects the advances and changes in all business during the past one hundred year and its message is particularly timely today in view of the tremendous contribution made by American business to the war effort.

● TRADE PRACTICE CONFERENCE

A trade practice conference will be held under the auspices of the Federal Trade Commission for the canvas cover industry in the Netherland Plaza Hotel, Cincinnati, August 2, beginning at 10 a. m., E.W.T. An official of the Commission will preside.

Products of the industry include tents, tarpaulins, awnings and canopies made wholly or principally of canvas, duck, drill, jean, osnaburg, or sheeting. All persons, firms, corporations or organizations engaged in the manufacture, sale or distribution of such products are invited to attend or send representatives to the conference and to participate in the proceedings.

● AWARDED DREXEL INSTITUTE MEDAL

S. A. Berryann, assistant export manager for the Brown Instrument Co., Philadelphia precision industrial instrument division of Minneapolis-Honeywell Regulator Co., has been awarded honor medal for the highest average attained in chemical engineering, junior year, at the Drexel Evening School of Drexel Institute, Philadelphia.

● BULLETINS ON SPECTROPHOTOMETRY

Two papers on the subject of "Spectrophotometry" have been prepared by the Research Department of the Calco Chemical Division, American Cyanamid Company.

"Spectrophotometry and the Colorist," Calco Technical Bulletin No. 756, prepared by Mr. E. I. Stearns, discusses the interpretation of the spectrophotometric data and suggests methods of application of these data to mill production and research problems and "Identification of Organic Pigments by Spectrophotometric Curve Shape," Calco Technical Bulletin No. 754, prepared by R. Abbott and E. I. Stearns, illustrates the general method of approach to the problem of identification of organic pigments by their characteristic absorption curve shape.

Copies of these bulletins may be secured by addressing the Advertising Department, Calco Chemical Division, American Cyanamid Company, Bound Brook, New Jersey.

● CLARK THREAD COMPANY APPOINTMENT

Dr. Frederick W. Adams, formerly associated with the Pittsburgh Plate Glass Company in their product development department, has been appointed director of research of the Clark Thread Company

Dr. Frederick W. Adams

of Newark, N. J., and associated companies. He will be responsible for the development of plans for the coordination and expansion of research within this organization and will make his headquarters at the New York offices of the company.

● THREE U. S. PATENTS ISSUED TO DAN RIVER COTTON MILLS

Three patents issued on various processes and owned by Riverside & Dan River Cotton Mills, Inc., are described briefly as follows: U. S. Patent 2,097,012, covers the art of treating fabrics with resins, both synthetic and natural in such a manner as not appreciably to change the appearance of the treated fabric, but to impart to it improved qualities such as greater abrasive resistance, increased tensile strength and other valuable properties. U. S. Patent 2,334,199, covers the application of pigments and bonding material simultaneously to yarn and fabrics. The coloring matter is so fixed or set on the fabric that the finish is permanent to washing and dry cleaning and added wear is imparted to the fabric by offering an additional surface against abrasion. U. S. Patent 2,220,958 covers the product as well as the art of increasing the tensile strength and decreasing the stretch of textile yarns by the application of bonding materials. This process is applicable to all types of fibers in their various forms and is not limited in the kind of bonding material used.

● NEW BOOKLET ON "AMIOCA"

Announcement has been made by the Technical Departments of American Maize-Products Co., National Starch Products Inc., and Stein, Hall & Company, Inc., that a booklet on "Amioca" has been jointly prepared and is now available for distribution. The booklet details the physical and chemical properties of this new domestic starch and lists many applications in which "Amioca" products appear of special interest.

Copies may be obtained without charge by addressing any of the three companies named above, and the assistance of their technical departments in appraising "Amioca" products for specific needs is likewise available.

● NATIONAL STARCH PRODUCTS APPOINTMENT

National Starch Products Inc. announces the appointment of Capt. Mack E. Kittay as manager of its Southern Division. He will coordinate company activity in the Southern territory, extending from Texas east to Florida, and will operate from a district office at 1201 Commerce Avenue, Houston, Texas.

Capt. Kittay has returned to National after two years in Service, first as Chemical Officer in the Trinidad Sector and Base Command, and later as Commanding Officer of the Chemical Section of the Trinidad General Depot. Before going overseas, he was stationed at the office of the Chief of Chemical Warfare Service, Chemical and Rubber Section, Industrial Division, Washington, D. C.

● NEW du PONT BOOKLET

A new booklet on "Three-Dimensional Seeing, The Science of Color and Light For Better Vision in Industry," is now being made available by the Du Pont Company Finishes Division.

The booklet contains information derived from color-conditioning installations in more than a thousand plants. Recent results of a continuing Du Pont

research program are stated for plant management, maintenance and safety engineers.

Included in the color-illustrated brochure is a section devoted to the "Safety Color Code for Industry," a corollary to "Three-Dimensional Seeing." The Color Code recommends as a standard the use of specific color signals and symbols to denote specific hazards and safety equipment.

Photographs—many of them paired as "before-and-after"—show how contrasting colors increase production, reduce injuries and improve morale in machine shops, textile mills, garment and furniture factories, etc. A number of statements from major companies that have adopted "Three-Dimensional Seeing" are published in the booklet, copies of which may be obtained from the Finishes Division, E. I. du Pont de Nemours & Co., Wilmington 98, Del.

• JOINS SHELL OIL

Edward H. Schmidt, formerly with Borne Scrymser Co., Elizabeth, N. J., is now with the Shell Oil Company, 50 West 50th Street, New York 20, N. Y. Mr. Schmidt served as treasurer of the New York Section of the A.A.T..C.C. for a number of years and is at present a member of the sectional committee.

• MIXING EQUIPMENT COMPANY APPOINTMENT

Mixing Equipment Company of Rochester, New York, manufacturer of Lightnin and Mixco Mixers, announces the appointment of Edgar A. Rogers as exclusive representative in Georgia, Alabama and the major portion of Tennessee.

Having been engaged in consulting and sales work in the Chemical and Process Industries in this territory for many years, Mr. Rogers enjoys a wide acquaintance among manufacturers and engineers. He will make his headquarters in the Chattanooga Bank Bldg., Chattanooga, Tenn.

• APPOINTED DIRECTOR OF RESEARCH

Raymond K. Flege has recently been appointed Director of Research for the North Star Woolen Mill Company of Minneapolis and the Lima Woolen Mills Company of Lima, Ohio.

Mr. Flege was a research associate at Massachusetts Institute of Technology from 1931 to 1932, was with the Bauer and Black Division of the Kendall Company, as a research chemist, from 1932 to 1936. He then served as a chemical engineer with the Kendall Mills, Finishing Division of the Kendall Company, from 1936 until he became associated with North Star.

• WARWICK PLANT TO BE IN OPERATION SHORTLY

Warwick Chemical Company's new Richmond Works plant at Wood River Junction, Rhode Island, which was ceremoniously dedicated on June 28th, is expected to be in operation on or shortly after the first of August.

This will be the fourth operating unit for Warwick Chemical Company, other plants being located in West Warwick, Rhode Island, Rock Hill, South Carolina, and Chanute, Kansas. Sales offices are at 580 Fifth Avenue, New York City and a research laboratory at 221 West 57th Street, New York City.

• POLYETHYLENE GLYCOL PRICES LOWERED

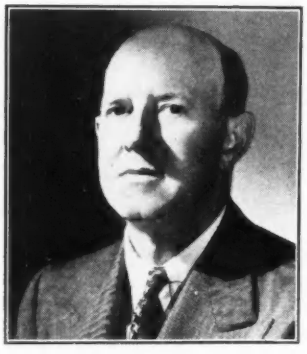
Carbide and Carbon Chemicals Corporation, a Unit of Union Carbide and Carbon Corporation, announces a reduction of five (5) cents a pound in the price of certain polyethylene glycols and the "Carbowax" compounds, effective June 15, 1944. The prices for polyethylene glycols 200, 300, 400, and 600, and for "Carbowax" compounds 1000, 1500, 1540, 4000, and 6000 become 30 cents a pound in drum quantities, and 29 cents a pound in carloads or combination carload quantities packed in drums.

Further information on properties and uses of these useful and interesting liquids and waxes is available from Carbide and Carbon Chemicals Corporation, 30 East 42nd Street, New York 17, N. Y.

OBITUARY

FRANCIS P. GORMLEY

FRANCIS P. GORMLEY, President of the Electro Metallurgical Company and a number of other units of the Union



Francis P. Gormley

Carbide & Carbon Corporation, 30 E. 42nd St., New York, died at his home, 340 Oxford Road, New Rochelle, New York, July 13, at the age of 56.

Mr. Gormley joined the staff of Union Carbide at Saulte Ste. Marie, Michigan in 1909, and served continuously in various production and executive capacities since that time. On May 22nd this year he was elected president. He is survived by his wife, Mrs. Nelle McInnes Gormley; a son and daughter.

Wool Dyeing—

(Concluded from Page 331)

DISCUSSION

H. Foster asked if there was any difference with regard to fastness to light between a dyeing which had been levelled up after peroxide treatment and a normal dyeing.

The Lecturer said that, in his view, there was no difference in fastness to light between dyeings on peroxide-treated wool and dyeings on normal wool.

In explaining a point raised by a member with regard to removing a fault by stripping and re-dyeing, the Lecturer said that one method of correcting a dyeing fault was to strip and re-dye with a selected dye. He did not mean to imply that the stripping process would have any effect on the level-dyeing properties, but merely to suggest stripping and re-dyeing with dyes which might be expected to dye more level than the dye originally used.

A. W. Dudbridge said that most lecturers on the subject of faults in wool dyeing missed an important factor. In the woolen trade considerable quantities of recovered wools were employed, and in the processes of recovery a good deal of black oil was used. It was very difficult to remove black oil in scouring, with the result that it was left in the piece before carbonizing. This made it difficult to dye the piece after carbonizing. The carbonizer was blamed, but the trouble was due to the fact that the pieces had not been prepared properly. Could the Lecturer give any information about mechanical damage, and whether he had seen any pieces which dyed lighter in the damaged places than in the undamaged places?

The Lecturer that that, whilst he agreed with Mr. Dudbridge about the effects of faulty scouring and the importance of preparing pieces properly before dyeing, he had had to restrict himself to certain aspects of the subject. With regard to mechanical damage, he supposed that such things as mill rigs were referred to, but he did not think they had any specific action on the wool fiber. He had not seen any pieces that dyed lighter because, for example, they had been torn.

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

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LOWELL, MASS.

An Appeal For Advertising Support of the Year Book of the A.A.T.C.C.

Work on the preparation of the 1944 edition of the Year Book of the American Association of Textile Chemists & Colorists is now under way and it is hoped to publish the volume in the early fall. The sole income of this publication, from which the costs of production are met, comes from receipts for advertising therein.

Owing to very materially increased costs of production, the Association is faced with the likelihood of a deficit in meeting the expenses of this volume. Because of this condition and also because of the very real advertising opportunity it affords, this appeal is directed to all concerns which sell materials, services or equipment to the textile wet processing industry.

A great majority of the more than 700 pages which comprise this volume are devoted to technical information such as standard testing methods for various fastness requirements, lists of available dyestuffs and chemical specialties, etc. Because of this fact the volume is in almost daily use in every textile laboratory and dyehouse in the country.

This year more than ever before the volume will be in demand for constant reference by all mills operating on Government contracts because of the fact that the tests adopted by the Association have been accepted as standard by most Government purchasing depots.

In view of the above, it is obvious that an advertising message in its pages will reach those individuals chiefly concerned with the purchasing of textile chemical requirements for their respective mills, not only once but constantly throughout the year during which the volume is current, as a work of reference.

Should there by any profit from the publication, the surplus will be transferred to the Research Fund of the Association which is constantly handling projects vital to the industry as a whole.

The advertising rates, despite increased costs, remain unchanged at $75 per page and $40 per half page. The Howes Publishing Company acts as agents for the Association in the publication of the volume but has no share in its finances. Inquiries regarding advertising space should be directed to them at 440 Fourth Avenue, New York, 16, N.Y.

Very truly yours,

L. A. Olney.

L. A. Olney, Chairman
Year Book Committee

LAO:GB

SANDOZ PRESENTS *The color achievement of the month*

Valiant Violet BY HADLEY

Even violet is a valiant color this year, as Fashion turns to the dyer's art for variety in the midst of wartime restrictions.

Sandoz congratulates the Cashmere Corporation of America, makers of Hadley Knitwear, for adding another fine sweater to America's informal wardrobe, for sports, cool summer evenings or winter twilights.

Subtle colors like Sandoz' Alizarine Light Violet 2RC and Brilliant Alizarine Light Violet FFR (Pat.) are contributing widely to the production of these fashionable shades on worsteds and woolens. Both colors have proved exceptionally fast-to-light.

In "thinking ahead with textiles", Sandoz has also developed certain Blues which, above all others, combine fastness to light *and* fulling. Brilliant Alizarine Milling Blues, BL, G and SL, will identify these colors on your order, should you wish to investigate these distinctive products of Sandoz' Research.

To assist you in filling your needs accurately, for a wide range of acid, chrome and direct dyes as well as auxiliary chemicals for all natural and synthetic fibres, Sandoz application laboratories are in New York, Boston, Philadelphia, Charlotte, Los Angeles and Toronto; stocks are carried in those cities. Other Sandoz branches: in Chicago, Paterson and Providence.

Sandoz, next month, will salute another of its customers among the leaders of the textile industry.

SANDOZ CHEMICAL WORKS, INC., 61 VAN DAM STREET, NEW YORK 13, N. Y.

SANDOZ *thinks ahead with textiles*

SANDOZ

OFFICIAL U. S. NAVY PHOTO

TRUE BLUE

Bulldozer or pick and shovel, rifle or machine gun, the SEABEES are proficient with any. The Construction Battalions are building and fighting their way to new glories—*fighting men true to the traditions of the boys in Navy Blue!*

Helpful in the preparation of *true blue* Azo dyes for Navy Blue is SOLVAY Sodium Nitrite. This pure, free-flowing crystal is especially suited for manufacturing dyes and for textile dyeing. For dyes that won't die—specify SOLVAY Sodium Nitrite—and be sure of highest quality!

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SOLVAY

TRADE MARK REG. U. S. PAT. OFF.

SODIUM NITRITE

PIONEERING

Over 60 years ago Zurnoil pioneered in the research, development and processing of products for scouring, stripping, penetrating, lubricating and finishing textiles. Many Zurnoil basic ideas have become common to the entire textile chemical industry but Zurnoil continuing research still pioneers in providing new, more efficient, more economical products. For your requirements, whether for improving existing methods or for solving problems in your processing of the new synthetics, Zurnoil friendly service and proved products are at your disposal.

Zurnoil
TEXTILE CHEMICALS

SCOUR "A"
Eliminates the use of soap

PENT LEV S. B.
Superior Penetrating Leveler

ALCOPHATE
(powder or paste)
Efficient Wetting Out, Penetrating and Leveling Agent

O. F. ZURN COMPANY
PHILADELPHIA 32, PA.

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BIXAMINE BROWN BRLL

- Direct
- Homogeneous
- Level Dyeing
- Excellent light fastness

BICK & CO., Inc.

Manufacturing Chemists

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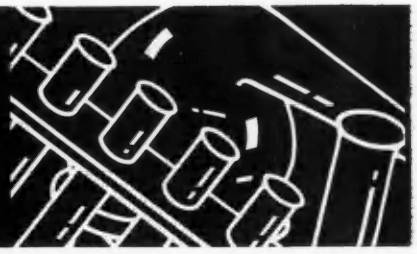
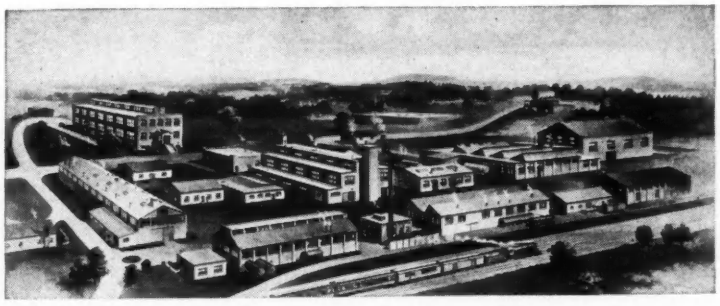


NYANZA

ANILINE & ALIZARINE COLORS
TEXTILE CHEMICALS



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NYANZA COLOR & CHEMICAL COMPANY, Inc.

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CANADIAN AGENTS:

Charles Albert Smith Limited, 123 Liberty St., Toronto, Canada

• Classified Advertisements •

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $6.25 per column inch or less per insertion.

WANTED: A demonstrator-salesman for the textile specialties with experience in the textile processing to represent an old established but progressive manufacturer. Advise age, experience and qualifications. Box 573.

WANTED: Salesman by a New Jersey Manufacturer of Boil-off compounds and textile finishes. Salary and commission. State qualifications and draft status. Box 576.

REPRESENTATION OFFERED: Established selling organization. Has excellent contacts with the Printing and Dyeing trade in New England. Interested as a selling agent on fine chemicals or printing specialties. Box No. 577.

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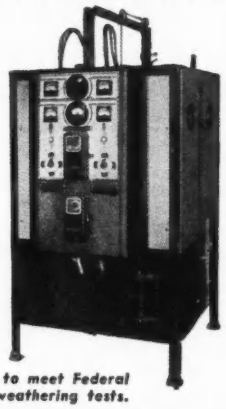

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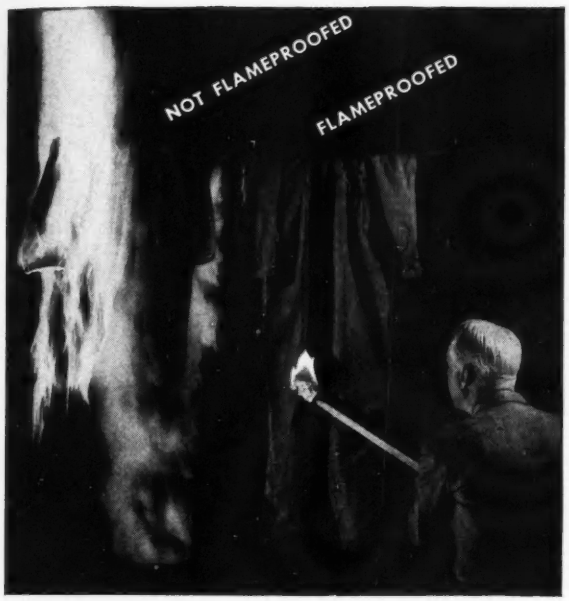

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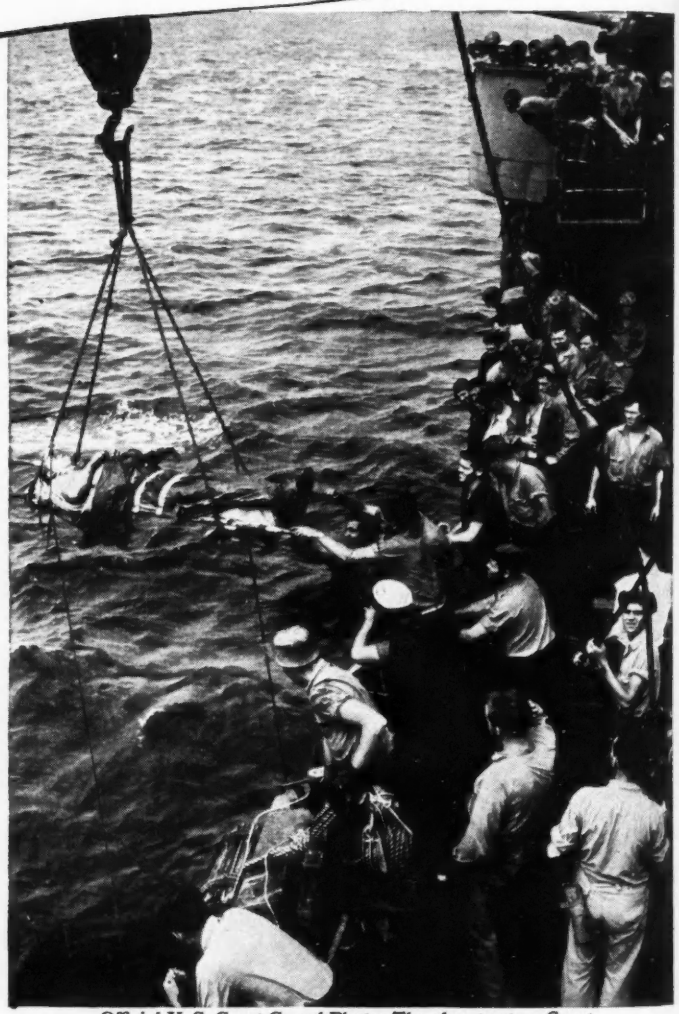

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